

Calgary



TT2021-0690

Updates to SNIC Policy to Respond to Significant Winter Storm Events

Presentation to SPC on Transportation and Transit – June 16, 2021

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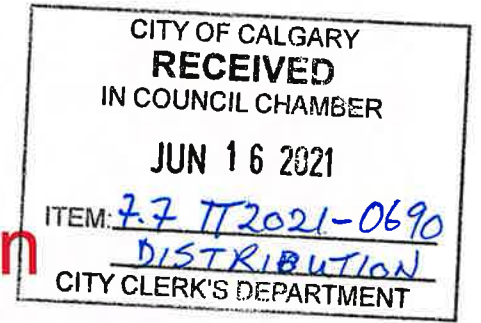
Council Direction

2021 January Combined Council:

- Direction to update SNIC Policy to give Administration ability to declare snow emergency
- Criteria, response options, cost estimates for snow emergencies
- Investigate use of private volunteers to support SNIC response.

Recommendation

- Approve amendments to the Council Snow and Ice Control (SNIC) Policy to provide Administration authority to declare a snow emergency to deploy additional resources on a city-wide basis during significant winter weather events.



COUNCIL POLICY

Before

Policy Title: Snow and Ice Control Policy

Policy Number: TP004

Report Number: TTP2003-39, C2007-44, LPT2011-57

Approved by: City Council

Effective Date: Interim policy approved 2009 December 14 and amended 2011 June 20

Business Unit: Roads

BACKGROUND

The City of Calgary Roads business unit is responsible for The City's snow and ice control program and is committed to helping make The City of Calgary safe for pedestrian and vehicle passage along the developed rights-of-ways according to the City-Council approved policy and priority system.

The Snow and Ice Control Policy is necessary to make a clear statement of the intent of the City of Calgary winter maintenance operations and establish the priorities, standards and service levels of the snow and ice control program. An effective and efficient snow and ice control program is necessary to allow the municipality to function under normal winter weather conditions to reduce snow and ice hazards and to provide reasonable winter mobility on City infrastructure including roadways, sidewalks and pathways.

- Snow emergency: In a general sense it refers to a winter storm that overwhelms the base compliment of snow fighting equipment and personnel. Actions can include banning all traffic except emergency personnel, restrictions or prohibitions to on-street parking and closure of public buildings. Normally issued before the storm begins as drivers may not be able to reach their destinations after it has begun.

PROCEDURES and RESPONSIBILITIES

City Council

- When deemed necessary, or on the advice of the City Manager, declare a Snow Emergency allowing the Roads Maintenance Division to return roads to a passable condition in fastest time possible. The declaration should include restrictions on vehicle movement, parking and the operation of public buildings.



Updated

Council Policy

Policy Title: Snow and Ice Control Policy

Policy Number: CP2021-01

Report Number: TTP2003-39, C2007-44, LPT2011-57

Adopted by/Date: City Council / 2011 June 20

Effective Date: 2011 June 20

Last Amended: 2011 June 20

Policy Owner: Roads Business Unit

1. POLICY STATEMENT

- 1.1 The City of Calgary Roads business unit is responsible for The City's snow and ice control program and is committed to helping make The City of Calgary safe for pedestrian and vehicle passage along the developed rights-of-ways according to the City-Council approved policy and priority system.

3.1.19 Snow Emergency

Refers to a winter storm that overwhelms the base compliment of snow response equipment and personnel. Typically issued before a storm begins. A snow emergency will be declared at the discretion of the Directors of Roads and will result in the activation of the Emergency Operations Centre. The following criteria could warrant a declaration:

- Public right-of-way becomes impassable and/or emergency services express concerns about their ability to respond; major disruptions to transit operations.
- City resources and contractors unlikely to restore operations within forty-eight hours after full deployment.

PROCEDURES and RESPONSIBILITIES

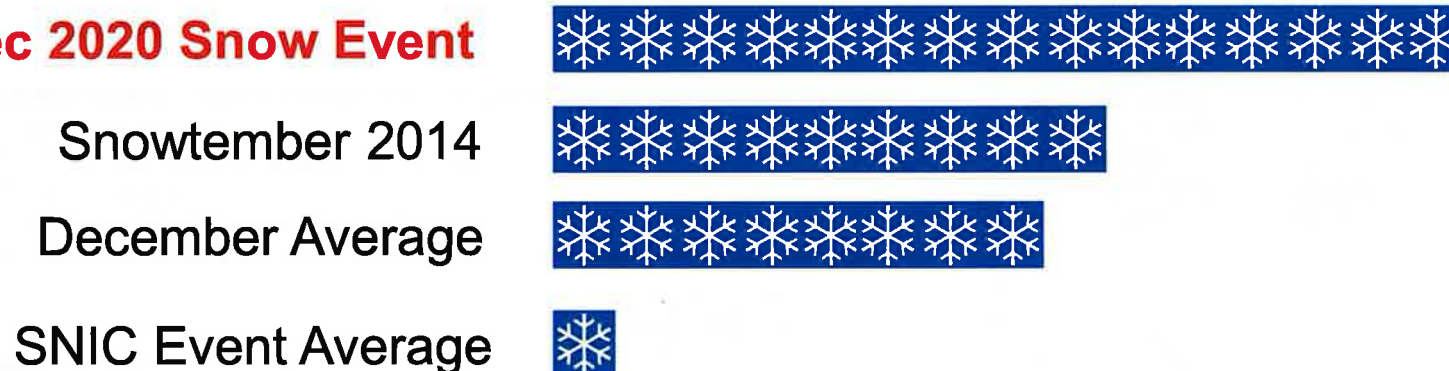
The Director of the Roads Business Unit

- Authorize the instructions or specifications necessary to implement this policy of City Council and bring forward any changes in the policy upon direction of City Council or the General Manager of Transportation.
- Act as a liaison with the General Manager of Transportation on policy related matters.
- When deemed necessary, declare a Snow Emergency allowing operational resources to return the transportation network to passable condition in the fastest time possible and response activities will involve deployment of all available resources to ensure mobility, declaration of parking restrictions and ploughing to bare pavement on residential roads.
- Exercise control of the staff of the Roads Business Unit directing such assistance as may be required to the Roads Maintenance Divisions during snow related emergencies.

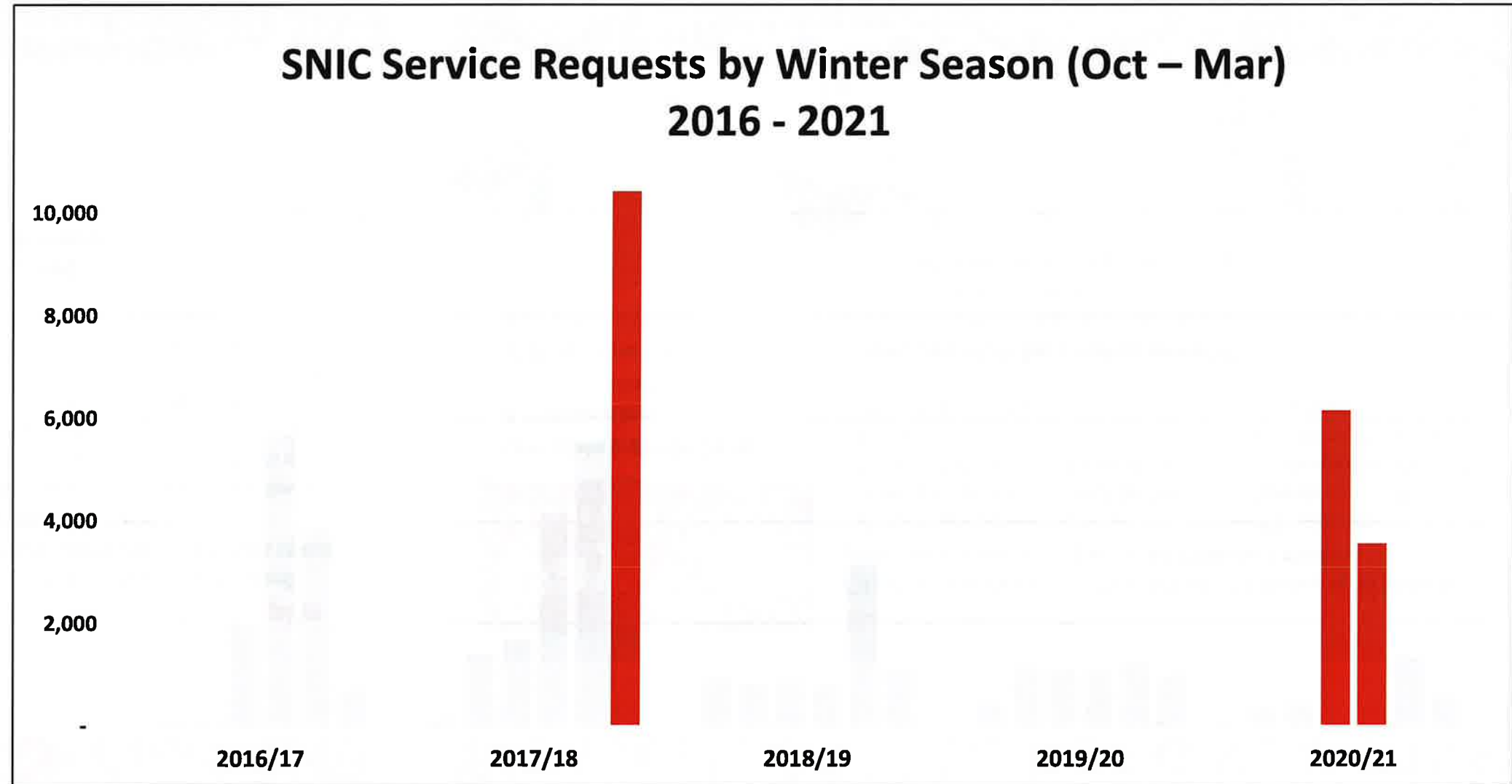
Historical Major Snowfall



Dec 2020 Snow Event



Snow & Ice Control Service Requests



We work 24/7 to keep you moving

When it snows, we have a plan

Once a snowfall ends, the Council-approved seven-day snow plan comes into effect city-wide.

The plan sets out which roads, sidewalks, bikeways and pathways our crews will clear, to what extent, and on which day. While it's still snowing, and before the plan is activated, crews are out on major roads plowing snow to prevent build-up and applying anti-icing material.

**Over 16,000
lane kilometres**



Did you know? This would be equivalent to driving back and forth between Calgary and Edmonton 54 times.

Day 1

OF SEVEN-DAY PLAN



Completed within 24 hrs.

4,048 lane km
(25% of all roads)

477 km of pathways

617 km of sidewalks

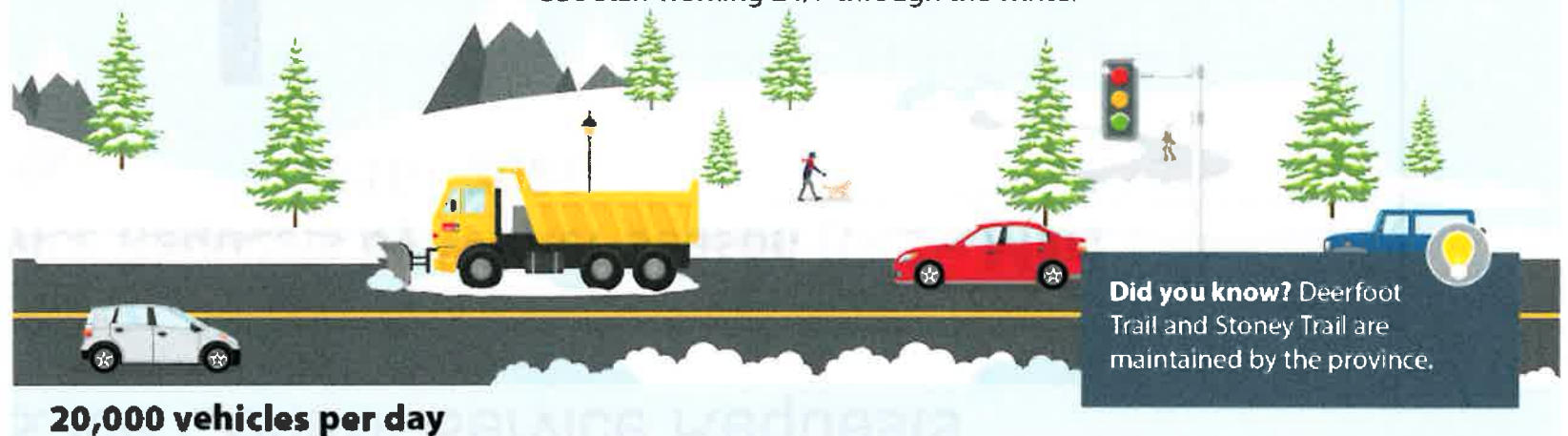
Major roads are Priority 1

City Crews work during snowfall and 24 hours after snowfall ends, plowing and removing snow on Priority 1 routes.

- Major roads plowed to bare pavement include: Crowchild Trail, Memorial Drive and Macleod Trail
- Downtown
- Pedestrian overpasses
- LRT platforms
- Downtown cycle tracks
- Designated sections of pathways and sidewalks along City-owned properties

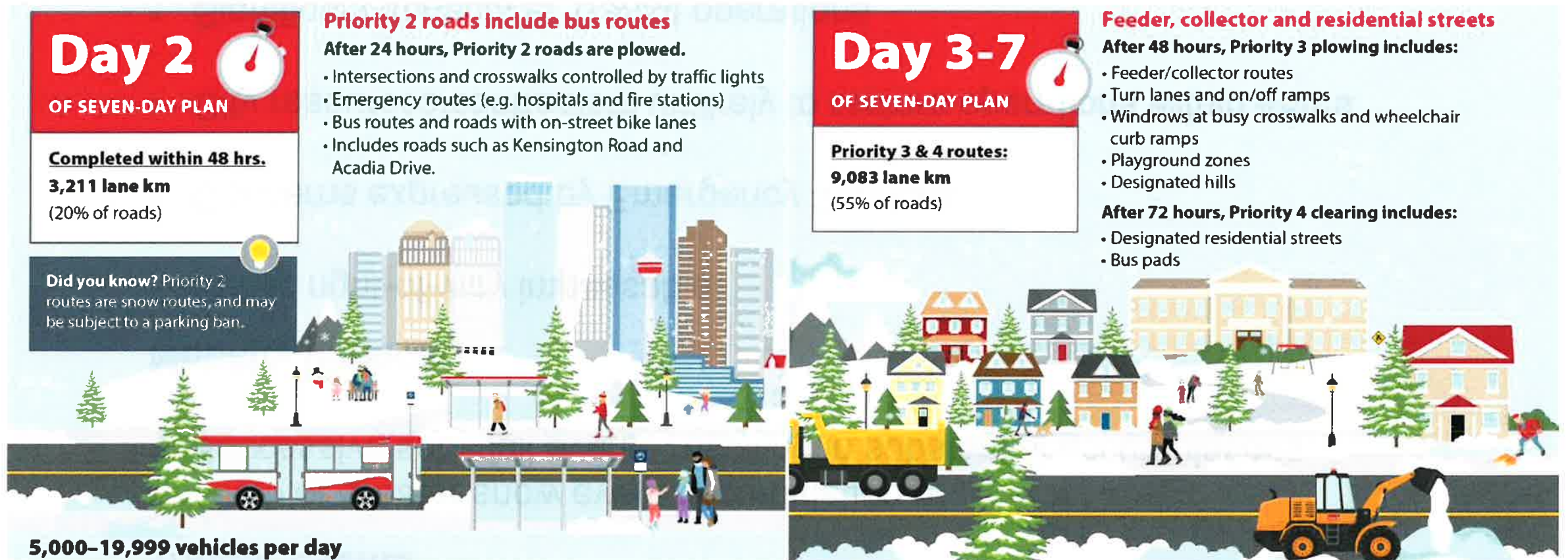
Equipment/staff for a typical snowfall:

- 100–120 pieces of heavy equipment working daily
- 1,000–1,200 total hours
- 330 staff working 24/7 through the winter



20,000 vehicles per day

Did you know? Deerfoot Trail and Stoney Trail are maintained by the province.



Criteria for Snow Emergency

Trigger Events

- 40cm or greater snow event accumulation or
- Successive snowfall events resulting in substantial accumulations

Mobility Impacts

- Public right-of-way impassable
- Concerns expressed by Emergency Services
- City resources/contractors unlikely to restore operations within 48hrs
- Significant impacts to Transit operations

Declared by Administration (Director of Roads)

Response Options

	Level 1	Level 2 (Recommended)	Level 3
Option	Status Quo	Plow clear travel path in residential areas after Priority 1 & 2 routes done	Plow clear travel path + snow removal in residential areas once snow stops falling
Cost	No Change	\$2M - \$3M incremental cost per event	\$12M - \$16M per event Capital upgrades for new snow storage facilities
Timing / Impacts	No Change	5 - 7 days city-wide Sides of streets used for windrow storage	4 - 6 weeks Limited snow storage capacity

No Level 2 response after March 1

Snow Removal vs Snow Clearing



- Pilot Truck
- Snow Blower
- Trackless/Holder
- 5 Tandem Trucks
- Grader

8x–10x cost of clearing / capital upgrades



- 1 - 2 piece of equipment
(Grader) supported by a sander

Volunteer Efforts to Support SNIC

- Reviewed opportunities to leverage private volunteers. Interested parties could contact City and commit to meeting insurance, liability, equipment and safety training
- On street activity discouraged due to safety issues / lack of coordination
- Increased clearing response mitigates need for on street volunteers

Risks

- Public Safety: risks of working on street and proper certification
- Placement of snow piles / environmental concerns such as flooding
- Traffic signs struck and not reported
- Blocking sidewalks, access point, driveways, wheel chair ramps

Communications and Parking



Residential Parking Advisory

Additional tool during snow emergencies to inform residents to use alternate off street parking so crews can complete clearing.

- No tickets for vehicles left on residential streets
- Residents can park on cleared Priority 2 Routes
- May be required to move off street for 2 - 3 days



Snow Route Parking Ban

During a snow route parking ban, parking is temporarily restricted on designated snow routes for up to 72 hours.

Recap



Amendment to SNIC Policy: Administration can declare snow emergency



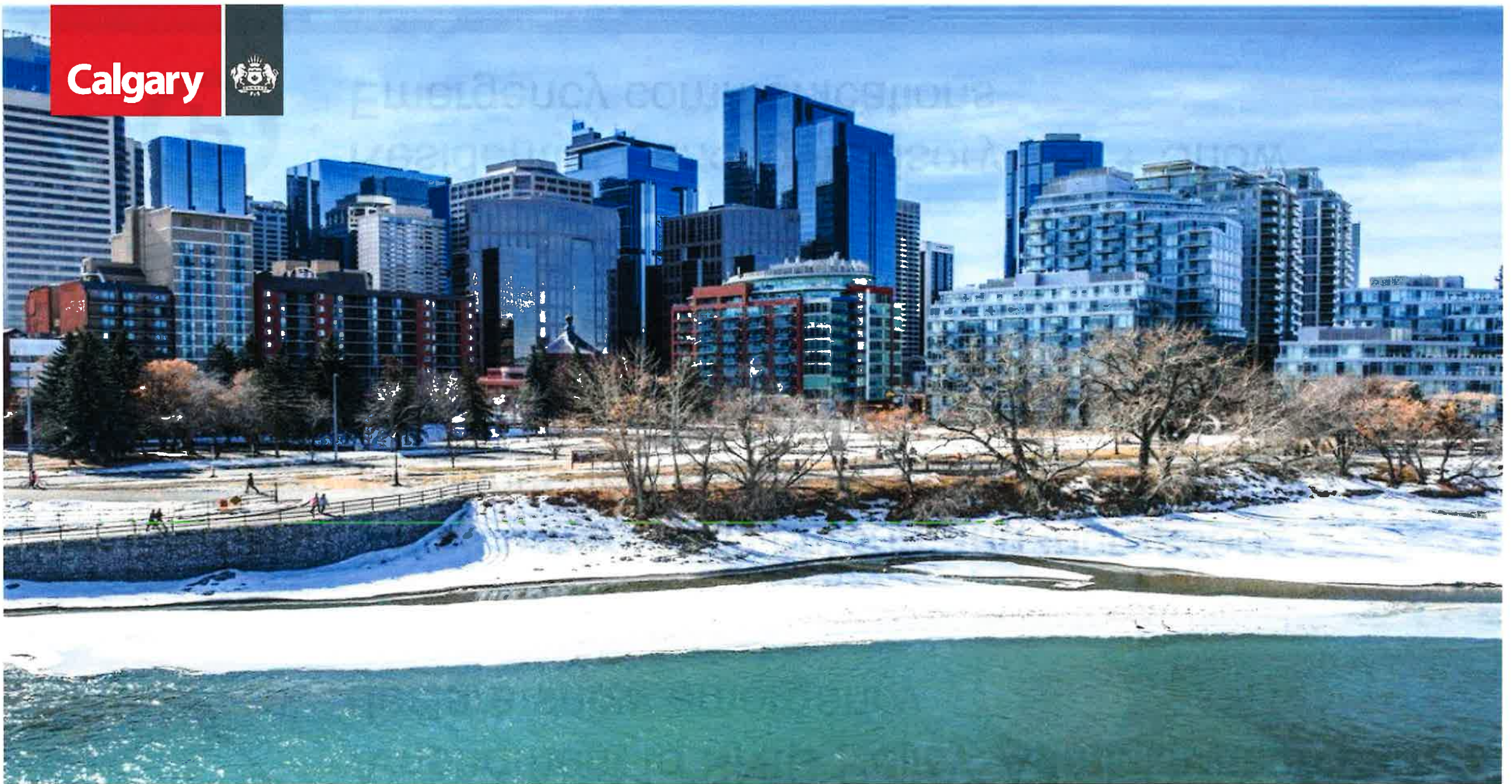
Snow emergency criteria and increased response to residential areas



Volunteer efforts reviewed



Residential Parking Advisory tool + Snow Emergency communications



Questions

Snow Emergency Response

Depending on situation, degree of operational response may include the following:

- Deployment additional City staff / equipment from various City Business Units
- Deployment of contractors
- Approach Province, and/or other jurisdictions to provide support
- Centralized emergency coordination (CEMA)
- Citizen communication strategy

SNOW AND ICE CONTROL PROGRAM PLAN 2020 - 2021



Transportation Department
The City of Calgary, ROADS
Maintenance Division

Residential Clearing Policy

Calgary

Residential roads plowed following each snowfall with accumulations of 5 cm or greater. Not plowed to bare pavement.

Removal of windrows is responsibility of the abutting property owner.

Responsible clearing

The City follows a Council-approved Seven-Day snow plan, to maintain a safe network while being budget conscious. Our snow plan does not include:

- Plowing residential roads down to bare pavement
- Snow removal from residential areas
- Clearing back lanes, alleyways



Edmonton

Clearing begins once a 5cm snowpack has formed. Roads plowed to a smooth snow pack (not bare pavement) within 5 days from the end of snowfall

Windrows less than 30 cm that block driveways are the responsibility of the adjacent property owner.



Why Review Policies



The world changes

COVID, legislation and agreements,
environment, relationships

Organization changes

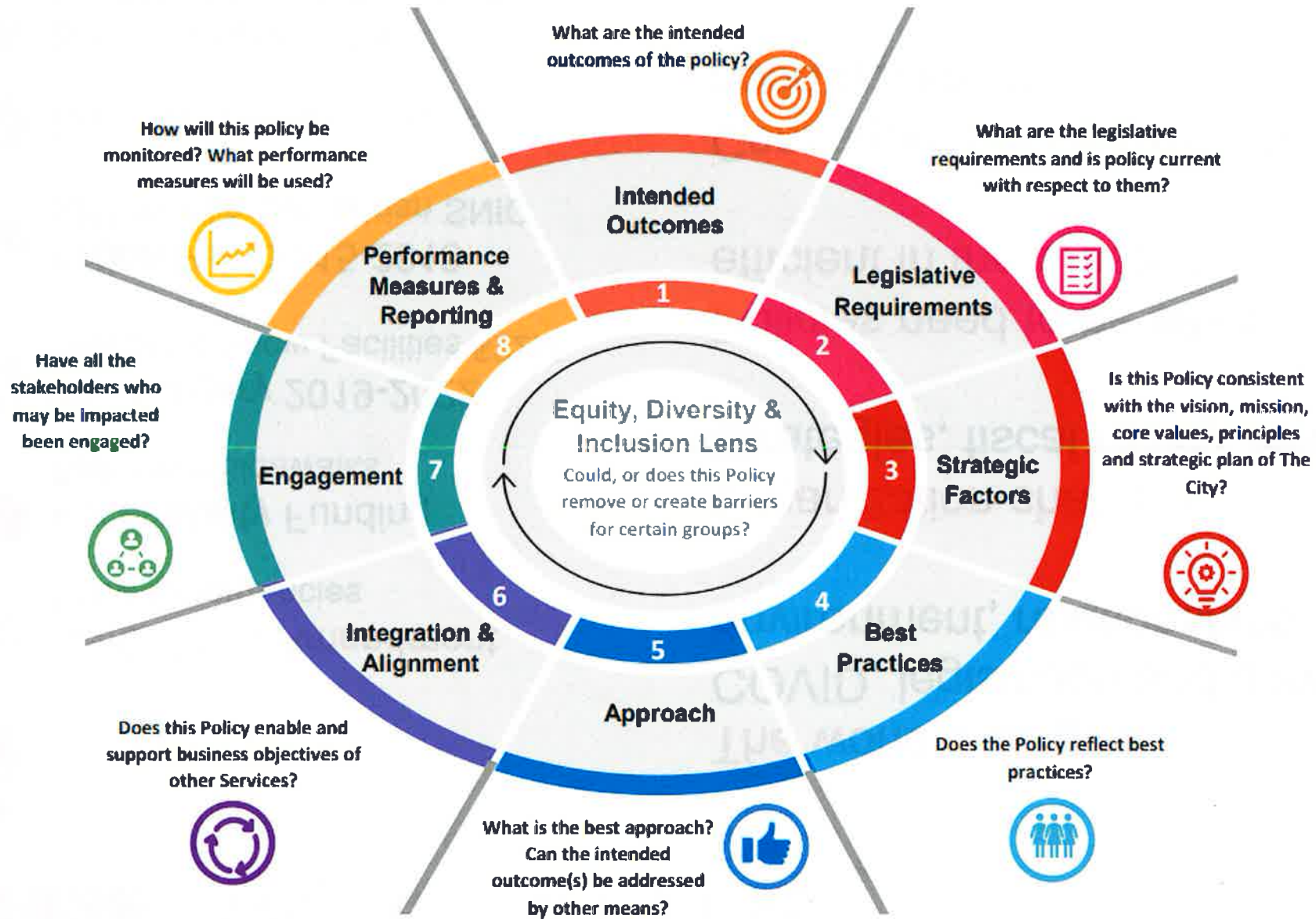
Strategies, fiscal reality, realignment

**Policies need to be effective and
efficient in the present**

Consequences: Barriers to strategies,
good governance



Policy Evaluation Wheel

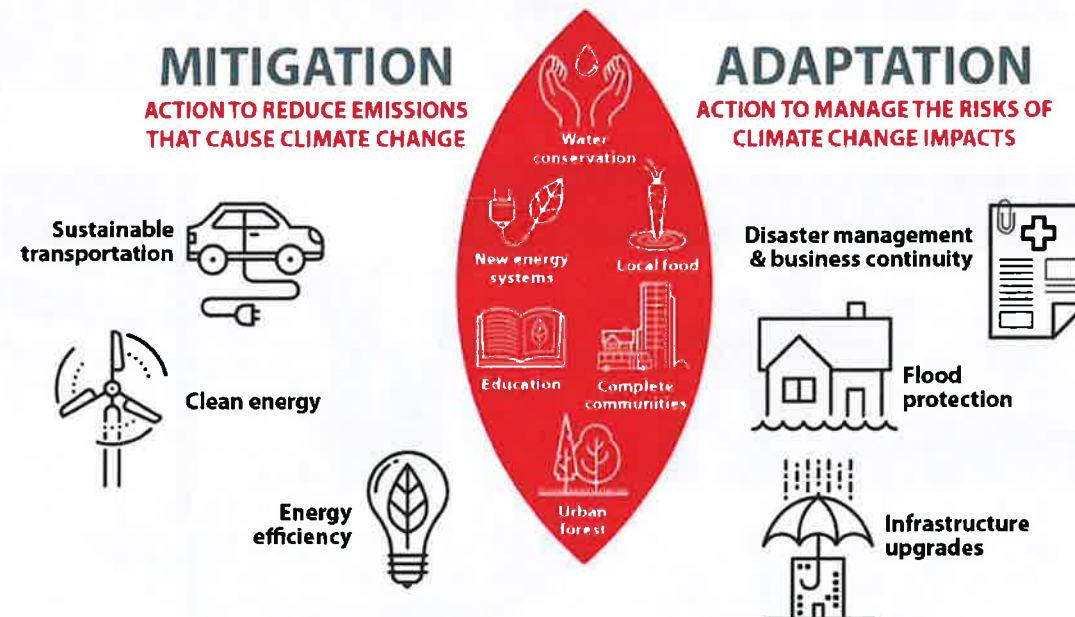




- We have a responsibility to prepare for, respond and adapt to the impacts of climate change
- Climate Resilience Strategy: Reduce GHG emissions in 2050 by 80% below 2005 levels

Building Climate Resilience

- **Mitigation** – reduce GHG emissions
- **Adaptation** – manage risks from impacts
- A social and economic issue



A FOCUS ON RISK:

CRITICAL INFRASTRUCTURE & SEVERE WINTER WEATHER



CRITICAL INFRASTRUCTURE

On 2020 October 22, CEMA presented a report on critical infrastructure to the Emergency Management Committee.



SEVERE WINTER WEATHER

CEMA was scheduled to present a severe winter weather report to the Emergency Management Committee. Due to COVID-19, the report was cancelled.

CONSIDERATIONS

TRENDS



KEY FACTORS



The frequency and intensity of extreme weather events is increasing and is expected to be exacerbated by climate change.

The most vulnerable to severe winter weather are those experiencing homelessness, seniors, children, people with chronic illnesses, and people working or exercising outdoors.

While each of these types of storms may occur independently, Calgary typically sees two or more occur at the same time.

MITIGATION



Robust event forecasting and early warning systems are in place to notify the public, emergency response personnel, and health providers in advance of extreme winter and cold events.

Warming centres, building codes, community awareness programming, designated snow routes, and emergency response plans are also in place to minimize the impacts of these events.



Ward Councillor Input

Ward Councillor	Considerations
Cllr. Woolley	<ul style="list-style-type: none"> Chinooks, Budget for SNIC, Service Levels
Cllr. Chahal	<ul style="list-style-type: none"> Private Contractors, Cul-de-sacs, School Zones, Leveraging Technology
Cllr. Chu	<ul style="list-style-type: none"> Grader Gates, 7 Day Snow Plan
Cllr. Farrell	<ul style="list-style-type: none"> Investing in better service Gender lens in Policy Cost of Growth
Cllr. Carra	<ul style="list-style-type: none"> Economies of scale with more investment
Cllr. Magliocca	<ul style="list-style-type: none"> Snow melting technology and environmental impacts
Cllr. Sutherland	<ul style="list-style-type: none"> Cycle track clearing, Investment/practices in other cities
Cllr. Colley- Urquhart	<ul style="list-style-type: none"> Snow removal in Cul-de-sacs Citizen Feedback / Surveys
Cllr. Davison	<ul style="list-style-type: none"> Look at the gaps/enhanced criteria around residential snow clearing and how we can innovate for big events Good customer service and responding to our citizens, meeting expectations for how resources are applied. Updates to policy are good governance Belts and suspenders around when resources are applied

Snow Event #11 / 12 Snapshot

Snow Event #11, December 21-25, 2020

Estimated Cost	1.7M		
Materials used	Salt 2,475 tonnes	Pickle 2,270 tonnes	Calcium/Brine 576 litres
Lane KM required to be cleared (16,342 km)	P1 routes 4,048km	P2 routes 3,211km	P3/4 routes 9,083km

Snow Event #12, December 26, 2020 – January 3, 2021

Estimated Cost	2.5M		
Materials used	Salt 4,320 tonnes	Pickle 1,570 tonnes	Calcium/Brine 0 litres
Lane KM required to be cleared (16,342 km)	P1 routes 4,048km	P2 routes 3,211km	P3/4 routes 9,083km

Major Snow Event Snapshot

- Snowfall Event #11: Up to 40cm in 24 hours in some parts of Calgary. Snow started evening of Dec. 21(1 month worth of snowfall in short time)
- Snowfall Event #12: 7cm of snow on successive days (Dec. 26/27)
- Combined Cost: \$4.2M
- 311 Service Requests: 7258 (Dec. 21 - Jan 6)
- Priority 1 & 2 routes completed within 48 hours
- No Snow Route Parking Ban called
- Maximum response within 24 hours of the event
- Calgary Transit provided service throughout the storm by utilizing snow detours

During 2012-2014 Business Plan Council approved establishment of SNIC Reserve with funding from FSR.

SNIC Reserve (\$000s):

	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>	<u>2012</u>
Opening/Current balance	10,260	-	5,426	12,482	15,000	8,940	-	4,141	3,220	-
Closing balance	-	6,260	-	5,426	12,482	15,000	8,940	0	4,141	3,220





XVI WORLD WINTER SERVICE AND ROAD RESILIENCE CONGRESS

ADAPTING TO A CHANGING WORLD

Calgary, Alberta, Canada | February 8-11 | English



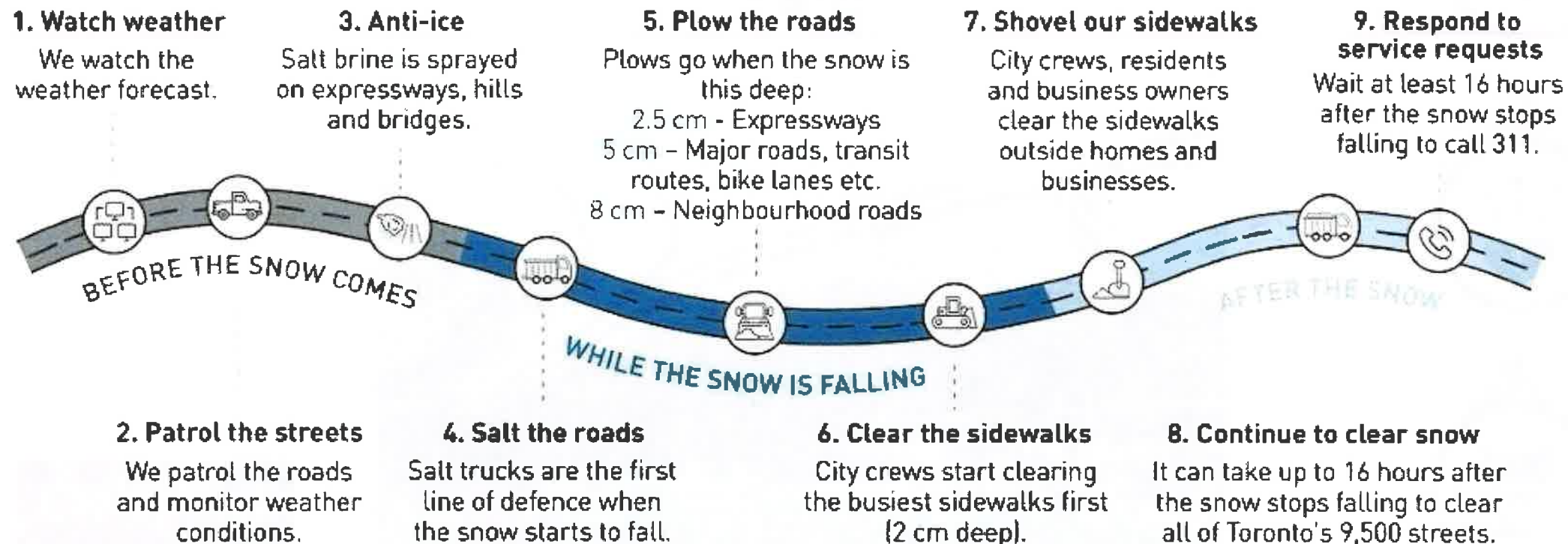


SNOW PLAN

KNOW ABOUT SNOW IN TORONTO

Winter in Toronto is cold and snowy. That's why the City of Toronto is ready with a snow clearing plan. We all have a role in keeping streets and sidewalks safe. Here is what you need to know this winter.

What we do





\$30-40 million

The City spends approximately **\$30 million to \$40 million** on snow removal and ice control annually, depending on weather conditions.

+3,000 km
OF SIDEWALKS AND
PATHWAYS

+930 km
OF BACK LANES

Over **3,000 km** of sidewalks and pathways are cleared by crews during an average city-wide snow clearing operation.

Crews will clear over **930 km** of back lanes during an all-out city-wide snow clearing operation.

1.7 million CUBIC FEET

We operate four snow disposal sites with a combined capacity of **1.7 million cubic feet**.

300 PIECES OF HEAVY EQUIPMENT

An average city-wide snow clearing operation requires approximately **300 pieces of heavy equipment**.

2.5 DAYS

It takes approximately **2.5 days** (or five 12-hour shifts) to clear all residential streets during a residential plowing operation, with crews working around the clock.



Spreaders switch from salt to sand once the temperature falls to **-7 degrees Celsius**.

SALT & SAND

We use on average **26,000 tonnes of salt** and **60,000 tonnes of sand** each winter season to improve traction on roadways.



Approximately **100,000 litres of beet juice** is used each winter season for anti-icing operations.



+7,200 km
OF ROADWAYS

Crews will clear over **7,200 km** of roadways during an all-out city-wide snow clearing operation.



2017 Budget vs Total Roads

1. Montreal	\$200M	4,000 km
2. Toronto	\$90M	5,605 km
3. Ottawa	\$64.3M	6,000 km
4. Edmonton	\$63.7M	11,800 km
5. Quebec City	\$43M	2,400 km
6. Winnipeg	\$40M	7,100 km
7. Calgary	\$38.1M	16,000 km
8. Halifax	\$23.1M	3,844 km
9. St. John's	\$15.8M	1,400 km
10. Saskatoon	\$11.5M	758 km
11. Regina	\$9.2M	1,000 km
12. Moncton	\$5.4M	1,116 km
13. Charlottetown	\$3.8M	250 km
14. Vancouver	\$750,000	409 km
15. Victoria	\$36,000	112 km



Snow Storage Site	Capacity (cubic metres)
Highfield	~600,000
Spring Gardens	494,000
Pumphouse	56,000

Snow dumps reached capacity in 2018
(equals 102,000 loads of snow)

How do we tackle the snow?

The City's snow fleet includes:

- 27 Graders
 - 9 Snow Blowers
 - 92 Tandem trucks with under body and/or front plows
 - Variety of pedestrian snow clearing equipment
-
- Contracted crews are kept on retainer to help deal with excessive snowfall
 - Target trouble spots, including transit not included in P1/2 routes early on.
 - Provide capacity to assist City forces when necessary.



What materials are used?

Salt

Used to melt snow and ice when road temperatures are between 0°C and -10°C and weather is not expected to get worse

Pickle

Used to create traction when road temperatures are below -5°C with low temperatures expected to continue

Anti-Icing Agent

Preventative material used before snowfall when road temperatures are 0°C or lower

2013

December snowfall breaks 112-year record

[f](#) [t](#) [e](#) [r](#) [in](#)

43.8 cm have fallen so far in December, according to the city

CBC News · Posted: Dec 21, 2013 10:49 AM MT | Last Updated: December 21, 2013



The city has created a new website - [Calgary.ca/snow](#) - where Calgarians can get the latest information on snow and ice control. (CBC)

December snowfall in Calgary has broken a 112-year record, according to the City of Calgary.

Daily Snowfall

Date	Total
Dec 30 2013	0.0 cm
Dec 29 2013	0.0 cm
Dec 28 2013	1.0 cm
Dec 27 2013	0.0 cm
Dec 26 2013	0.0 cm
Dec 25 2013	0.0 cm
Dec 24 2013	0.0 cm
Dec 23 2013	0.0 cm
Dec 22 2013	1.0 cm
Dec 21 2013	1.0 cm
Dec 20 2013	0.0 cm
Dec 19 2013	0.0 cm
Dec 18 2013	10.6 cm
Dec 17 2013	0.0 cm
Dec 16 2013	5.0 cm
Dec 15 2013	4.0 cm
Dec 14 2013	0.0 cm
Dec 13 2013	0.0 cm
Dec 12 2013	0.0 cm
Dec 11 2013	0.0 cm
Dec 10 2013	3.4 cm
Dec 9 2013	4.0 cm
Dec 8 2013	3.0 cm
Dec 7 2013	0.0 cm
Dec 6 2013	0.0 cm
Dec 5 2013	0.4 cm
Dec 4 2013	0.0 cm
Dec 3 2013	1.0 cm
Dec 2 2013	14.0 cm
Dec 1 2013	0.0 cm